

12. A method of manufacturing a fluorocarbon-based polymer coating film comprising the steps of:

a. contacting a substrate having a surface containing hydroxyl groups with a non-aqueous solvent comprising a material comprising chlorosilyl groups to form a siloxane-based film on the substrate surface; and

b. coating the siloxane-based film with either (1) a non-aqueous solvent comprising a compound comprising a fluorocarbon group and a chlorosilyl group or (2) a solvent comprising a compound comprising a fluorocarbon group and an alkoxysilyl group.

13. The method of manufacturing the fluorocarbon-based polymer coating film according to claim 12, wherein the substrate is made of the member of a group consisting of glass, metals, plastics, and ceramics.

14. The method of manufacturing the fluorocarbon-based polymer coating film according to claim 12, wherein the substrate is made of a plastic material treated in a plasma atmosphere containing oxygen.

15. The method of manufacturing the fluorocarbon-based polymer coating film according to claim 12, wherein said material comprising chlorosilyl groups is selected from the group consisting of SiCl_4 , SiHCl_3 , SiH_2Cl_2 and $\text{Cl}-(\text{SiCl}_2\text{O})_n-\text{SiCl}_3$, wherein n is an integer.

16. The method of manufacturing the fluorocarbon-based polymer coating film according to claim 12, wherein said compound comprising a fluorocarbon group and a chlorosilyl group is represented by a formula: $\text{CF}_3-(\text{CF}_2)_n-(\text{R})_m-\text{SiX}_p\text{Cl}_{3-p}$ where n represents 0 or an integer; R represents an alkylene group or a hydrocarbon substituted group containing $\text{C}=\text{C}$ or $\text{C}\equiv\text{C}$, a silicon atom or an oxygen atom; m represents 0 or 1, X

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17. The method of manufacturing the fluoroalkyl silane compound according to claim 12, wherein the compound of formula (I) containing a chlorosilyl group is represented by:

$$\text{CF}_3\text{-(CF}_2)_n\text{-(R)}_m\text{-SiY}_q(\text{OA}')_{3-q}$$

where n represents 0 or an integer;

R represents an alkylene group or a hydrocarbon chain having at least one C≡C, a silicon atom or an oxygen atom;

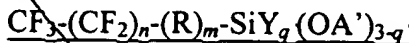
m represents 0 or 1;

Y represents a hydrogen atom, an alkyl group or an alkoxy group containing an alkoxy group or a fluorine-containing alkyl group;

OA' represents an alkoxy group; and

q' represents 0, 1 or 2;

and the method further comprises a step of bonding the fluoroalkyl silane compound to the surface of the substrate.



R represents an alkylene group or a hydrocarbon substituted group containing C=C or C≡C, a silicon atom or an oxygen atom;

m represents 0 or 1;

OA' represents an alkoxy group; and

and the method further comprises a step of baking the substrate after coating.

19. The method of manufacturing the fluorocarbon-based polymer coating
according to claim 12, wherein a material represented by a formula:



where Y represents an alkyl group; A'' represents a hydrogen atom or an alkyl group;
and t represents 0, 1, and 2; is added to the solvent of (2).

21. A method of producing a non-wetting surface on a glass substrate comprising the steps of:
- a. depositing a siloxane-based primer layer on a surface of the glass; and
 - b. coating the siloxane-based primer layer with a composition comprising a perfluoroalkyl alkyl silane.

22. A product made by the process of claim 16.
23. A product made by the process of claim 17.
24. A product made by the process of claim 18.
25. A product made by the process of claim 19.
26. A product made by the process of claim 21.

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